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THE RENT-BUY DECISION FOR MILITARY FAMILIES

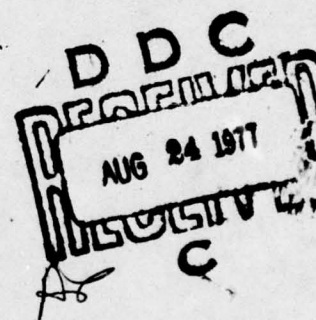
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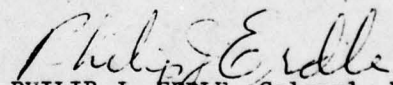
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Introduction

The typical service family probably confronts the rent-buy decision five or more times during the course of a military career. The decision to live in government quarters (rent) or to invest in an owner-occupied home is among the major financial-planning judgments a service member will make. Yet, the rent-buy decision is seldom given the analytical treatment it merits.

The decision to purchase a home upon military reassignment is frequently based on grandiose stories of capital appreciation in residential real estate. Although some growth in property value is essentially certain in an inflationary economy, the rate of growth over time and geographic location is uncertain and difficult to predict. The incredible escalation of property values in Southern California and in metropolitan Washington, D.C., in recent years, for example, demonstrates the potential for substantial financial gain in residential real estate if the investor has the near-term liquidity to meet monthly payments. However, the 20-percent-per-year property appreciation rates in these areas are atypical.

The purpose of this paper is to provide an analytical framework for comparing the income-tax and capital-appreciation advantages of home ownership with the cash-flow advantage of government quarters. The analysis is in a financial and not a welfare framework. The assumption employed here is that the

service member wishes to maximize his terminal wealth position; an investment point of view is taken. Admittedly, some home buyers prefer to use a welfare rather than a wealth-maximization criterion in the rent-buy decision. For example, there may be pride-of-ownership, prestige, and emotional-security aspects in home ownership which override a financial analysis. In addition, the decision to buy a house in lieu of accepting government quarters often reflects a desire for a higher housing standard and is not done in a wealth-maximization context. These considerations are set aside in this analysis.

In formally considering the rent-buy decision in a wealth-maximization context, there are both deterministic and assumptive elements to consider. For example, the prospective monthly mortgage payment for any given loan principal, interest rate, and maturity is deterministic. However, the decision maker must make assumptions in regard to how long the home will be owned, what its value will be when it is marketed, whether the services of a realtor must be engaged, what the future levels of the quarters allowance will be, etc.

Once the facts and assumptions are in hand, the analytical procedure for comparing results of the rent decision to the buy decision is rather straightforward. One of two approaches can be taken: compare the net present value (NPV) of the future cash streams for each decision, or compare the terminal wealth positions for each decision. Conceptually, the two approaches are identical;

however, the second approach may be more intuitively appealing and, accordingly, will be used in this analysis.

Initially, the decision maker must explicitly quantify all variables impacting the problem. We have developed a series of seven tables here to accommodate this requirement. A hypothetical example will be followed to illustrate this algorithm.

First, the analyst must list all deterministic facts as suggested by Table 1. Note this example concerns the decision of whether to buy a \$50,000 home, under a new 9-percent, thirty-year loan with a 10-percent down payment requirement. This information yields a monthly loan repayment level of \$362.

To establish the total monthly payment for housing (line 10), one must add to line 6 estimates for the monthly costs of fire insurance, property taxes, and utilities (electricity, natural gas, water, sewer, and refuse collection).

Closing costs for the buyer (line 3) represent an escrow fee, American Title Association title policy, appraisal fee (if required), credit report, document-preparation fee, and a loan-origination or service fee (typically 1 percent of the loan principal). In this example, closing costs of \$800 are listed on line 3.

Line 11 reflects buyer's cash impounded by the mortgage company in a non-interest-bearing account. At the time a loan is initiated, the mortgage lender requires a one-year, paid-up fire insurance policy plus cash equal to two or more months of property

TABLE 1
DETERMINISTIC ELEMENTS

1. Purchase Price of Home	\$50,000.
2. Down Payment	5,000.
3. Closing Costs	800.
4. Mortgage Interest Rate	9%
5. Term of Loan	30 years
6. Monthly Principal and Interest (P and I) Payment	\$362.
7. Monthly Fire Insurance Payment (1st year)	11.
8. Monthly Property Tax Payment (1st year)	55.
9. Average Monthly Utility Payment (1st year)	115.
10. Total Monthly Payment including Utilities (1st year)	543.
11. Impound	264.
12a. Loan Paydown for the Year at End of Year 1	304.
12b. Loan Paydown for the Year at End of Year 2	320.
12c. Loan Paydown for the Year at End of Year 3	349.
12d. Loan Paydown for the Year at End of Year 4	379.
13. Marginal Income Tax Rate (Federal, State, Local)	20%
14. Realtor Commission for Selling Home	7%
15. Required Selling Expenses Other than 14 above	\$390.
16. Advertising Expenses if Home is Marketed by Owner	100.
17. Estimated Cost of 2-Month Delayed Sale	900.
18. Monthly Quarters Allowance - Year 1	243.

taxes and insurance premiums. These impounded amounts are returned when the home is sold. In this example, impounded cash is two months of fire insurance and property tax payments plus the first year's total fire insurance premium.

An amortization schedule for the loan (available from the mortgage-lending institution) will provide loan paydown information. In this example, we are interested in the paydowns for each of the first four years; the assumed period of ownership.

The marginal income tax rate (line 13) is used to determine the tax advantage arising from the deductibility of mortgage interest and property taxes. The marginal rate (the rate at which an additional dollar of income is taxed) for a captain with two children averages approximately 20 percent for federal taxation, the figure used in this illustration. In cases wherein a service member pays substantial state and local taxes, the marginal income tax rate may be considerably higher.

The most common realtor fee (line 14) is 7 percent, although a few communities have an established norm of 6 percent. In addition to this fee, the seller must purchase an owner's title insurance policy (average cost is .5 to .6 percent of property selling price), must pay nominal fees for deed recording and property tax proration services, and may be asked to share escrow fees with the buyer. This example assumes selling expenses (line 15) of \$390.

Line 16 represents costs associated with marketing a home

without the aid of a realtor. In this example, the estimated cost of two months of newspaper advertising is entered.

Line 17 reflects the additional costs of a possible delayed sale. The \$900 entry is an estimate of extra travel costs and the cost of a service member's maintaining an additional, temporary residence if the home is sold two months after a permanent change of station occurs.

Monthly quarters allowance for a captain is entered on Line 18.

Table 2 portrays categories of assumptions the analyst must make in the rent-buy decision analysis. Making these assumptions objectively is rather difficult. Depending on preconceived notions, one tends to bias these assumptions toward or against the buy decision. For example, a person eager to ride a supposed high crest of inflation in the housing market may choose to assume an annual appreciation rate of 15 percent when he buys a home. Realistically, this may be a hope and not an expectation. Hence, it is worthwhile to expressly recognize these propensities to be biased by making three sets of assumptions:

Assumption Group 1 (AG1) - Within the range of realism, make those assumptions which are optimistic with respect to the financial advantages of buying a home.

Assumption Group 2 (AG2) - Make those assumptions which reflect the most realistic expectations with regard to the variables in the rent-buy decision.

TABLE 2
ASSUMPTIONS

	<u>AG1</u>	<u>AG2</u>	<u>AG3</u>
1. Annual Percent Change in Fire Insurance	4%	5%	8%
2. Annual Percent Change in Property Tax	4%	5%	10%
3. Annual Percent Change in Utilities	5%	8%	15%
4. Average Monthly Cost for Upkeep/Repairs	\$5	\$15	\$30
5. Annual Percent Change in Quarters Allowance	16%	12%	5%
6. Annual Return on Investment (ROI) Rate*	6.25%	8%	12%
7. Annual Property Appreciation Rate	10%	6.5%	4%
8. Sale of Property	timely sale without realtor	timely sale with realtor	delayed sale with realtor

* The highest ROI rate is an element of AG3 and not AG1 because the ability to obtain high returns by investing on the open market is an argument against tying up cash in purchased housing.

Assumption Group 3 (AG3) - Within the range of realism, make those assumptions which are pessimistic with respect to the financial advantages of buying a home.

Table 2 lists the seven assumptions the service member must make in the context of optimism toward the buy decision (AG1), realism toward the buy decision (AG2), and pessimism toward the buy decision (AG3).

The first three items are self-explanatory.

Entry 4 represents the average monthly cost over the period of home ownership for such items as plumber services, hardware replacements, air conditioner and furnace servicing, wind damage, painting, dishwasher repairs, etc.

One must also make an assumption concerning what proportion of future military pay increases will be allocated to housing. Higher allocations to the quarters allowance make the rent decision comparatively more expensive and thereby favor the buy decision. If one assumes a 5-percent annual pay increase, on average the quarters allowance will increase by 16.5 percent if one-half of the pay increase is allocated to the quarters allowance and by 11.5 percent if 35 percent is allocated to the quarters allowance. This example assumes 16 percent, 12 percent, and an across-the-board increase of 5 percent.

Line 6 represents an estimate of the compounding growth rate the investor can achieve (on average) with invested cash. Depending on individual risk and liquidity preferences, this expected rate

can range from a 6.25-percent return at the credit union to 25 percent and more for dealing in commodity futures, stock options, wildcat drilling, etc.

The assumptions entered in line 7 are the most crucial and difficult in the analysis. These assumptions are best made on the basis of observing what has happened in a particular local housing market in the very recent past (discounting any peculiar, non-recurring influences) and assessing the future growth prospects of the community and neighborhood. In this regard, information on the demand for new residential construction in the local area, the community's new move-in rate, inflation rates for new construction in the immediate vicinity, and the recent trend in the monthly ratio of houses sold to total houses listed can be helpful.¹ One should keep in mind, however, that neither the growth rate in replacement costs of homes nor the rate of change in the government's "average price of a new home" statistic is necessarily a good surrogate for the property-appreciation rate in a local area. The property-

¹For the military member, the fortunes of the local housing market are very often directly related to the level of activity at an adjacent military installation. The likelihood of an expansion, cutback, or even closure of the installation should be an important component in assessing the prospects for escalating property values.

appreciation rate is very often considerably below these two widely-publicized measures.²

Finally, an assumption must be made with respect to whether the seller can find a qualified buyer without the assistance of a real estate agency. In some high-turnover areas in the proximity of military installations, many servicemen report good fortune in marketing their own homes. Statistics suggest, however, that to assume an owner can make a timely sale of his house without listing with a realtor is more optimistic than realistic.³

Terminal Wealth Under Buy Decision

Personal wealth under the buy decision will typically increase for two reasons: income tax advantages from home ownership, and appreciation in property value.

By completing Table 3, one can identify the simple income-tax

²Property values at any given moment are a function of market conditions for specific types and locations of real estate. At the time a residence is listed for sale, the market may very well be soft even in the face of rapidly escalating building costs. Accordingly, it is not uncommon for residential real estate to sell at fair market values that are below replacement cost plus land. The "average price of a new home" statistic incorporates growth in both quality and price levels. With a growing national income and a rising standard of living over time, this figure would be expected to increase even in a non-inflationary economy. Hence, changes in this statistic frequently exceed the appreciation rate for existing property.

³Although the probability of selling a home without the aid of professional sales services is probably higher in the military community than in a strictly civilian market, the odds nationally are not good. One source reports that about 95% of all homes sold in this country involve the aid of a realtor. See "Most Home Sales Handled by Realtors" in Colorado Springs Gazette-Telegraph, April 20, 1975.

TABLE 3

TAX ADVANTAGE OF MORTGAGE INTEREST AND PROPERTY TAX

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>
1. One Year P&I Payments	4,344	4,344	4,344	4,344
2. One Year Loan Paydown	<u>304</u>	<u>320</u>	<u>349</u>	<u>379</u>
3. Interest Paid (line 1 minus line 2)	4,040	4,024	3,995	3,965
4. Property Taxes Paid				
AG1	660	686	714	742
AG2	660	693	728	764
AG3	660	726	799	878
5. Total Homeowner Deductions (line 3 plus line 4)				
AG1	4,700	4,710	4,709	4,707
AG2	4,700	4,717	4,723	4,729
AG3	4,700	4,750	4,794	4,843
6. Marginal Tax Rate	20%	20%	20%	20%
7. Simple Tax Savings (line 5 times line 6)				
AG1	940	942	942	941
AG2	940	943	945	946
AG3	940	950	959	969
8. Approximate Return on Invested Tax Savings (compounded growth of line 7 at ROI rate)				
AG1	0	59	121	187
AG2	0	75	156	246
AG3	0	113	240	385
9. Compounded Tax Savings (line 7 plus line 8)				
AG1	940	1,001	1,063	1,128
AG2	940	1,018	1,101	1,192
AG3	940	1,063	1,199	1,354

savings and the compounded tax savings that arise from the deductibility of mortgage interest and property taxes from gross income. Three series of computations are required, one representing each assumption group. In this example, AG1 involves 4 percent growth in property taxes per year and an annual return-on-investment (ROI) rate of 6.25 percent. For AG2 and AG3, these figures are 5 percent and 8 percent, and 10 percent and 12 percent, respectively.

The total compounded tax savings for all years (sum of entries in line 9 of Table 3 for each assumption group) is entered in line 6 of Table 4. In Table 4, net appreciation in property value is added to compounded tax savings and equity against the loan (line 7) to determine wealth change under each assumption group.

To determine terminal wealth under the buy decision, wealth change is added to the down payment and impound amount (cash and prepaid insurance held by the mortgage company). The down payment and the impounds are effectively "decommitted" when the home is sold and again become part of the cash assets of the seller. Accordingly, line 11 of Table 4 is the sum of the wealth change and the initial cash outlay.

Note that, with the assumption groups in this example, terminal wealth four years hence under the buy decision will range from approximately \$13,500 to more than \$32,000, with the most realistic expectation being about \$19,000.

TABLE 4
TERMINAL WEALTH UNDER BUY DECISION

	<u>AG1</u>	<u>AG2</u>	<u>AG3</u>
1. Selling Price	73,200	64,300	58,500
2. Purchase Price + Closing Costs	<u>50,800</u>	<u>50,800</u>	<u>50,800</u>
3. Gross Appreciation (line 1 minus line 2)	22,400	13,500	7,700
4. Selling Expenses (from Table 1)	<u>490</u>	<u>4,891</u>	<u>5,385</u>
5. Net Appreciation (line 3 minus line 4)	21,910	8,609	2,315
6. Total Compounded Tax Savings (from Table 3)	4,132	4,251	4,556
7. Total Loan Paydown (from Table 1)	<u>1,352</u>	<u>1,352</u>	<u>1,352</u>
8. Wealth Change (Sum of lines 5, 6 and 7)	27,394	14,212	8,223
9. Down Payment	5,000	5,000	5,000
10. Impounds	<u>264</u>	<u>264</u>	<u>264</u>
11. Terminal Wealth (Sum of lines 8, 9, and 10)	\$32,658	\$19,476	\$13,487

Terminal Wealth Under Rent Decision

The principal advantage of the rent decision under a wealth-maximization criterion is the higher level of cash flow. In addition to the availability of initial cash for investment purposes, which under the buy decision would have been absorbed by a down payment, closing costs, and impounds, there will typically be a positive, monthly cash-flow variance. This variance arises from the difference between the quarters allowance (rent) and the total monthly cost of purchased housing.

We can estimate the cash-flow variance under each assumption group with the aid of Table 5. Entry 6 in this table reflects the sum of the monthly payments for the loan, insurance, property taxes, utilities, and upkeep and repairs. Yearly growth in these monthly payments is reflected in this table in accordance with assumptions made in Table 2.

Line 8 of Table 8 shows the monthly cash-flow variance (the difference between the quarters allowance absorbed under the rent decision and the total monthly cash flow under the buy decision) by year and by assumption group. These values represent an estimate of the additional monthly cash available to the service member when living on base which would not be available if one lived in an owner-occupied home. These values are annualized in line 9.

This positive cash-flow variance arising from the decision to rent provides a flow of funds for investment on the open market.

TABLE 5
CASH-FLOW VARIANCE*

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>
1. Monthly P&I Payment	\$362	\$362	\$362	\$362
2. Fire Insurance				
AG1	11	11	12	12
AG2	11	12	12	13
AG3	11	12	13	14
3. Monthly Property Tax				
AG1	55	57	59	62
AG2	55	58	61	64
AG3	55	61	67	73
4. Monthly Utilities				
AG1	115	121	127	133
AG2	115	124	134	145
AG3	115	132	152	175
5. Average Monthly Cost for Upkeep/Repairs				
AG1	5	5	5	5
AG2	15	15	15	15
AG3	30	30	30	30
6. Total Monthly Cash Flow under Buy Decision (Sum of lines 1 thru 5 above)				
AG1	548	556	565	574
AG2	558	571	584	599
AG3	573	597	624	654
7. Housing Allowance (Cost of Renting)				
AG1	243	282	327	379
AG2	243	272	305	341
AG3	243	255	268	281
8. <u>Monthly</u> Cash-Flow Variance (line 6 minus line 7)				
AG1	305	274	238	195
AG2	315	299	279	258
AG3	330	342	356	373

TABLE 5
(Continued)

	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>
9. Simple <u>Annual</u> Cash Flow Variance (line 8 times 12)				
AG1	3,660	3,288	2,856	2,340
AG2	3,780	3,588	3,348	3,096
AG3	3,960	4,104	4,272	4,476
10. Approximate Return on Invested Cash-Flow Variance				
AG1	114	332	538	728
AG2	151	446	748	1,055
AG3	238	721	1,280	1,931
11. Compounded Annual Cash-Flow Variance (line 9 plus line 10)				
AG1	3,774	3,620	3,394	3,068
AG2	3,931	4,034	4,096	4,151
AG3	4,198	4,825	5,552	6,407

* This table measures the difference between the quarters allowance (the cost of renting) and the total monthly cost of purchased housing.

Line 10 portrays the approximate return on invested cash for the assumed ROI rate. The full value of the cash-flow variance, compounded for growth, is listed in line 11.

The other advantage of the rent decision, the return from investing initial cash, is measured with the aid of Table 6.

In Table 7, the cash advantages arising from the rent decision are brought together to yield the wealth change. Terminal wealth (line 5) reflects the sum of initial cash and the wealth change. For the assumption groups in this example, the terminal wealth for the decision to rent will range between approximately \$22,000 and \$31,000, with the best expectation at slightly more than \$24,000.

Comparative Analysis

We make our judgment on the rent-buy decision under a wealth-maximization criterion by comparing the results in Table 4 with those of Table 7. In this example and in most actual analyses, terminal wealth will be higher under the buy decision than under the rent decision if the assumptions made are those which are most optimistic toward the financial advantages of buying a home (AG1). The results with AG2 will differ according to the unique facts of each situation. In this example, if one considers AG2 to be generally the most realistic set of assumptions, a "buy" decision will be correct from a terminal wealth point of view only if the buyer is willing to bank on these modified assumptions: (1) a timely sale without a realtor and property appreciation at any rate greater than 6.5

TABLE 6

RETURN ON INITIAL CASH

Down Payment + Closing Costs + Impounds = \$6,064.

Approximate Return on Initial Cash	<u>YEAR 1</u>	<u>YEAR 2</u>	<u>YEAR 3</u>	<u>YEAR 4</u>
AG1	\$379	\$403	\$428	\$454
AG2	485	524	566	611
AG3	728	815	912	1,022

TABLE 7
 TERMINAL WEALTH UNDER RENT DECISION

	<u>AG1</u>	<u>AG2</u>	<u>AG3</u>
1. Total Compounded Cash Flow Variance (Sum of line 11, Table 5)	\$13,856	\$16,212	\$20,982
2. Approximate Return on Initial Cash (Sums from Table 6)	<u>1,664</u>	<u>2,186</u>	<u>3,477</u>
3. Wealth Change (Line 1 plus line 2)	\$15,520	\$18,398	\$24,459
4. Initial Cash	<u>6,064</u>	<u>6,064</u>	<u>6,064</u>
5. Terminal Wealth (Line 3 plus line 4)	\$21,584	\$24,462	\$30,523

percent or (2) a sale through a realtor and property appreciation at any rate greater than 8.5 percent.

Depending on one's penchant for complexity, the dimensions of the rent-buy decision analysis could be extended to consider additional factors. For example, the difference in transportation costs may be substantial under some circumstances. One may wish to include a comparison of the tax liability that arises from returns on invested cash (under the rent decision) to the potential exposure to capital-gains taxation (under the buy decision). In addition, some analysts may choose to give consideration to the long-term gains of converting an owner-occupied home to rental property.

Summary

This report has identified the essential elements of the rent-buy decision and has suggested a methodology for selecting the optimal decision under a wealth-maximization criterion. Some service members, however, choose to use a welfare-maximization criterion instead.

The financial advantages accruing to the home owner arise from a reduced income tax liability and from appreciation in property value. On the other hand, the decision to rent contributes to an increase in terminal wealth by freeing initial cash and generating a positive monthly cash-flow variance, both of which can be invested on the open market.

This paper does not suggest an owner-occupied home is not a good investment. However, for the service member who has the option of living on base at a comparatively low monthly cost, owning a home may not necessarily be the most productive use of the personal resources he has allocated for investment purposes.

When a service member buys a house, he is committing (investing) both a stock of money (downpayment, closing costs, and impounds) and a flow of money (the additional monthly cost of owner-occupied housing above and beyond the quarters allowance). The crux of the rent-buy decision is whether this stock and flow of cash have a more productive alternative.

The optimal solution to this problem in a world of uncertainty is based on the expressed assumptions the analyst makes and upon one's relative optimism or pessimism toward the financial advantages of buying a home.